DOCUMENT RESUME

ED 437 030 IR 019 856

AUTHOR Allison, Bill
TITLE Facilitating Student Achievement in Writing through the Deft Employment of Computer Technology.
PUB DATE 1999-05-00
NOTE 68p.; Master's Action Research Project, Saint Xavier University/IRI Skylight.
PUB TYPE Dissertations/Theses (040)
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Academic Achievement; Computer Attitudes; Computer Literacy; *Computer Uses in Education; Courseware; Essays; Grade 9; High Schools; *Instructional Improvement; Questionnaires; *Student Attitudes; Student Surveys; Tables (Data); Teaching Methods; Thinking Skills; *Writing (Composition); *Writing Instruction; Writing Skills
IDENTIFIERS *Computer Assisted Writing; Document Analysis; Guided Practice; Illinois; Technology Integration

ABSTRACT

This report describes a strategy for infusing computer technology into the essay composition process in order to enhance student achievement. The targeted population consisted of freshman high school students in a middle class community in central Illinois. Problems related to the use of computer technology in the learning process were documented through data collection via student surveys, document analysis of students' writing, observation checklists of student behavior in a computer lab, and interviews. Analysis of probable cause data revealed that the use of computer technology in the composition process without proper instruction in quality essay writing and basic computer literacy skills led to poor essays and technological oversimplification. In general, faculty in the targeted school reported student inability to use computer technology proficiently in the learning process. A review of solution strategies suggested by knowledgeable others, combined with an analysis of the problem setting, resulted in the selection of two major categories of intervention: explicit instruction of components of effective essay writing with guided practice, and explicit instruction of computer literacy skills in a computer lab with guided practice. Post intervention data indicated an increase in students' computer literacy skills, writing skills, and ability to engage in higher order thinking, as well as an increase in students' experiences with diverse educational software. (Contains 18 references.) (Author/MES)

Reproductions supplied by EDRS are the best that can be made
from the original document.

IR

ED 437 030

FACILITATING STUDENT ACHIEVEMENT IN WRITING THROUGH THE DEFT EMPLOYMENT OF COMPUTER TECHNOLOGY

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

W. Allison

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Bill Allison

An Action Research Project Submitted to the Graduate Faculty of the

School of Education in Partial Fulfillment of the

Requirements for the Degree of Master of Arts in Teaching and Leadership

Saint Xavier University & Skylight Professional Development

Field-Based Masters Program

Chicago, Illinois

May, 1999

IR019856

BEST COPY AVAILABLE

SIGNATURE PAGE

This project was approved by

Priscilla Hartzog Ed.D.
Advisor

Jeff Erickson
Advisor

Beverly Gulley, Ph.D.
Dean, School of Education

This thesis is dedicated to my high school football coach who once told me:

"Allison, there are two ways to make it in life: brains and brawn. Go for the brawn, boy."

Abstract

This report describes a strategy for infusing computer technology into the essay composition process in order to enhance student achievement. The targeted population consisted of freshmen high school students in a middle class community, located in Central Illinois. The problems related to the use of computer technology in the learning process have been documented through data collection via student surveys, document analysis of students' writing, observation checklists of student behavior in a computer lab, and interviews.

Analysis of the probable cause data revealed that the use of computer technology in the composition process without proper instruction in quality essay writing and basic computer literacy skills led to poor essays and technological oversimplification. In general, faculty in the targeted school reported student inability to use computer technology proficiently in the learning process.

A review of the solution strategies suggested by knowledgeable others, combined with an analysis of the problem setting, resulted in the selection of two major categories of intervention: the explicit instruction of components of effective essay writing with guided practice, and the explicit instruction of computer literacy skills in a computer lab with guided practice.

Post intervention data indicated an increase in students' computer literacy skills, writing skills, and ability to engage in higher order thinking. The post intervention data also indicated an increase in students who say they enjoy using computers in the learning process and an increase in students' experiences with diverse educational software.

TABLE OF CONTENTS

CHAPTER 1 - PROBLEM STATEMENT AND CONTEXT 1

General Statement of the Problem 1

Immediate Problem Context 1

The Surrounding Community 6

The National Context of the Problem 9

CHAPTER 2 - PROBLEM DOCUMENTATION 13

Problem Evidence 13

Probable Causes 22

CHAPTER 3 - THE SOLUTION STRATEGY 29

Literature Review 29

Project Objectives and Processes 35

Project Action Plan 35

Methods of Assessment 38

CHAPTER 4 - PROJECT RESULTS 39

Historical Description of the Intervention 39

Presentation and Analysis of Results 42

Conclusions and Recommendations 51

REFERENCES 54

APPENDICES 56

Appendix A: Survey of Students' Attitudes 56

Appendix B: Observation Checklist 57

Appendix C: Document Analysis 58

Appendix D: Writing Prompt 59

Appendix E: Post Intervention Interview 60

CHAPTER 1

PROBLEM STATEMENT AND CONTEXT

General Statement of the Problem

The students of the targeted high school exhibit signs of inadequate achievement related to the use of computer technology. Evidence for the existence of the problem includes teacher observation of technological simplification (i.e., a lack of understanding concerning the processes and role of technology in learning) and class projects that involve some aspect of technological employment.

Local Setting

Student Demographics

A quick comparison of the district and high school demographics presented in Table 1 will confirm that the high school is basically a microcosm of the district.

Table 1

Student Demographics of the District and High School

	District	High School
Total Enrollments	967	307
White	98.4%	98.4%
Black	1%	1%
Hispanic	3%	.3%
Asian/P. Islander	.3%	.3%
Native American	0%	0%
Low Income	3%	3%
Limited-English-Proficient	0%	0%
Dropouts	0%	0%
Attendance	97%	96.7%
Student Mobility	5.2%	3.3%
Ave Class Size	22.2	22.2

A summary of the student demographics of the targeted high school manifests a number of important distinguishing and defining characteristics. First, the population is almost entirely White in terms of race. Second, only 3% of the constituents are considered to have come from "low income" families. Third, student mobility is relatively low. Last, the attendance rate is relatively high.

Staff Demographics

Table 2 juxtaposes the staff demographics of the district with the staff demographics of the high school for the 1996-97 school year. However, more recent trends in the staff demographics at the targeted high school for the 1997-98 school year are the following. First the targeted high school hired five new teachers (replacing four regular positions and adding one new position) for the 1997-98 school year. This means that 20% of the staff are new to the high school. Considering the relative stability of

teacher employment at the school, this type of turnover is somewhat of an anomaly. Second, in terms of teachers with master's degrees, the current demographics of the targeted high school do not show that eight high school teachers are currently enrolled and working on getting their master's degrees. This too, will change the demographics of the targeted high school in a notable manner.

Table 2

Staff Demographics of the District and High School

	District	High School
Teachers with Bachelor's Degree:	60.2	16.5
Teachers with Master's & Above:	39.8	11
Average Teaching Experience:	15.3 Years	12.98
Pupil-Teacher ratio:	14.6:1	10.9/1
Pupil-Admin Ratio	214.9-1	200/1

Facility

The targeted high school is part of a unit district comprised of an elementary school and a building that houses the junior high and high school. Although the junior high and high school share the same library and cafeteria, they each have their own classrooms in separate parts of the building. The junior high is in the east third of the building and consists of ten core classrooms, one computer lab, and a special education facility. The high school is in the west two-thirds of the building and consists of 13 core classrooms and the following additional facilities: a technology center with four educational areas and a distance learning lab, one family consumer science lab, two gymnasiums, two technology education labs, one art lab, two science/biology labs, a band and chorus facility, a special education room, and a reading resource center. This building

also contains the district, guidance, junior high and high school offices. Due to their different schedules and locations, the high school and junior high students stay basically separated from each other throughout the day.

Academic Program

Students in the graduating class of 1998 must earn a minimum of 27 credits in order to graduate from the targeted high school. Three credits must be earned in English, three credits in mathematics, two credits in science, one credit in recent American History, one credit in Modern American History, one credit in World History, one-half credit in Contemporary Issues, one-half credit in Consumer Economics, one-half credit in Health, one-half credit in Speech, one-half credit in Driver's Education, one-half credit in Keyboarding, one-quarter credit for community service, and one-quarter credit in Physical Education.

One distinguishing characteristic of the targeted high school's academic requirements is its community service course. The community service requirement generates one-quarter credit towards graduation and requires that each student work in an approved program of 40 hours during their four-year high school career.

Required subjects are usually earned in the following years. Freshmen students must take English, mathematics, science, Computer Applications, Modern American History, Health, and Physical Education. Sophomores must take English, mathematics, science, World History, Speech, Drivers Education, and Physical Education. Juniors must take English, Recent American History, and Physical Education. Seniors must take Resource Management, Contemporary Issues, and Physical Education.

The targeted high school employs the eight block scheduling system. The eight block is a schedule based on an A-B day scheduling. Each day has four periods lasting 85 minutes along with a 25-minute activity period each day. An activity period is used for meetings for clubs and study time. The activity period is also used for students to "catch up" with their homework, if they missed a day of class.

The targeted high school offers a variety of vocational classes including Home Economics, Industrial Technology, and business courses. In many of these courses, the targeted high school has an articulation agreement with the local community college in these areas.

Students at the targeted high school have several opportunities to obtain college level credit while still in high school. The targeted high school offers distance learning to its students and to other area high schools via fiber optics and the local community college. Students at the targeted high school have the opportunity to take college level entrance English classes, which are offered as part of the high school English sequence. Through distance learning, students may also obtain high school credit in program areas that are not offered by the local district.

The targeted high school has a Tech-Prep Team that has been instrumental in designing and implementing several Education-To-Career programs. The targeted school has a large number of students involved in school-to-work programs as well as extra curricular activities.

The Surrounding Community

The school district serves a rural area encompassing 67.25 sq. miles. The village of 2,200 serves as the primary community. The total population the district serves is approximately 6,000. The district buses 66% of its student population of 967.

The targeted community is a rural town of 2,200 located in Central Illinois just 15 miles from the Peoria Metropolitan area. The community is a blend of farm and suburban bedroom communities. The rural population still outnumbers the village population by about 350, but only 8% of the community rely on agriculture for employment. There are 1,680 households within the targeted school district with 808 of the households located within the village. Recent demographics indicate that 56.9% of these households are made up of one or two people. Approximately 47% of the households have children under the age of eighteen. About 34% of the households have occupants 65 or older. A noteworthy statistic is the fact that 81% of the students of the targeted district live in traditional two-parent homes. Furthermore, 96% of these homes have at least one parent employed. About 52 % of the people in the community work in white-collar professional and technical areas (see Table 3).

BEST COPY AVAILABLE

Table 3

Community Demographics

Community Demographic	Statistic
Household Income	
Median Household Income:	$36,320
Income Less than $25,000:	32%
Income between $25,000-75,000:	60%
Income over $75,000:	8%
Employment	
Professional & Technical:	52%
Laborers:	16%
Craftsmen:	14%
Service:	10%
Farming:	8%
Family Employment	
Both Parents Employed:	49%
One Parent Employed	47%
Both Parents Unemployed:	4%
Education	
College Degree:	15%
High School Diploma:	66%
No High School Diploma:	19%
Culture	
White Population	5,332
Black Population	0
Asian Pacific Islander Population	5
Hispanic Population	50

The community is considered to be rural and agricultural, yet 52% of the people are professional and technical employees. Farmers make up only 8% of the population (see Table 3). The fact that 92% of those employed are employed outside of farming

indicates the community is changing from a rural community to a more suburban community.

Culturally, the population is clearly a Caucasian community as 98% of the population falls into this category. The Hispanic population makes up the largest minority group within the local community, but it is relatively small (see Table 3).

School Community Issues

In an interview with the principal of the targeted high school, the following issues were discussed as issues that have some bearing on the targeted high school.

The familial and religious composition of the community is beginning to change. What was once a community with a majority of Apostolic Christians and traditional two-parent families is beginning to become a community with multi-religious influences and single parent families.

A proposed tax cap for the county is also a concern. The targeted high school administration feels this will restrict the school's available monies if passed. Present resource monies must be spent carefully at this point in case the voters pass the tax cap.

Teacher turnover is very limited at this targeted high school as evidenced by the average teaching experience of 15.3 years. Less turnover shows that the targeted district is well established and is a relatively desirable school in terms of employment.

The targeted high school is open to employing new ideas and proven educational strategies. The eight-block has been put in place, many teachers are obtaining their master's degrees, and the district has one of the best computer/distance learning labs in the area

The fact that the housing costs are relatively high within the community causes a restriction on what socio-economic groups are able to move into the community.

Technology is valued at the targeted school district. For example, the targeted high school recently constructed a new technology center and hired a technology coordinator. In addition, the elementary school has a computer lab with a software specialist, while the junior high has its own computer lab with a part-time lab supervisor. Amazingly the targeted district has been able to keep its technology labs on the cutting edge while keeping educational spending in check.

National Context

The fact that many schools across America are focusing on implementing technology in the learning process can be easily documented. Indeed, President Clinton has endeavored to make the issue of acquiring computer technology for public schools a national priority (Knickelbine, 1997). In addition, American businesses are increasingly demanding that students come to work with previous experience with computer technology (Fulton, 1998). Since one could argue that the ultimate goal of education is to equip students for successful lives in the world of work, high schools and colleges feel pressure to provide a variety of technological opportunities for students. Hence, many schools are spending an increasing amount of money to equip computer labs with the latest high-powered computers and software in order to meet the expectations of the public and businesses (Knickelbine, 1997).

Though the current zeitgeist in American public schools could be likened somewhat to a technological gold rush, few educational pundits seem to be asking the more difficult questions about the pedagogical effectiveness of computer technology as

measured by student achievement. Since student achievement is at the heart of all well-reasoned educational endeavors and is inextricably bound up with the success of the school, computer technology must be assessed, at least in part, on its effectiveness to facilitate student achievement. Unfortunately, many people erroneously equate the employment of computer technology with student achievement. The fact of that matter is that when students use computer technology it does not automatically translate into higher student achievement. Debra Vaidero (1997), in an article in Education Week, cogently argues this precise point when she writes "Many educators are banking on the belief that technology improves student achievement. In reality, though, research on its effectiveness offers, at best mixed results" (p. 12). Contrary to popular opinion, the research on the impact of computer technology on student achievement shows both failures and success.

A recent study of one school district in Michigan showed that student achievement actually declined when computer technology became widely available.

> In 1995 the Detroit Free Press reported that Michigan Educational Assessment scores in the Romulus, Michigan, school district dropped to rank near the bottom of the metro Detroit districts. The decline came after a three-year, $24 million investment in computerized integrated learning systems. (Knickelbine, 1997, p. 71)

Furthermore, a recent study done to assess the effectiveness of a three-year, 14.1 million dollar investment by five New York counties showed that the schools' investment in computer technology did not significantly facilitate student achievement (Knickelbine, 1997). Studies like these demand that the cost effectiveness of implementing computer technology in education be thoroughly investigated.

Nevertheless, other studies show more positive results of computer technology on student learning. One recent study found that students who used computers to solve mathematical word problems

> did as well as students in traditional classroom at solving standard, one-step word problems. But they were significantly better than children in the control group at solving multistep word problems—the kind of complex reasoning that many education reformers say is so important. (Viadero, 1997, p. 13)

Another recent study of 36 California schools indicated that students who participated in a computer-aided science program "outscored students in traditional classrooms on their grasp of some scientific concepts" (Viadero, 1997, p. 13). In addition to these positive findings, some pundits believe that inner-city students have been greatly helped in their learning via computer technology (Viadero, 1997).

While the present state of understanding concerning the effectiveness of computer technology on student achievement is deficient of persuasive and comprehensive evidence (Trotter, 1997), to be sure, the public perception concerning the effectiveness of computer technology on student learning is at a notable high. According to a recent poll conducted by Phi Delta Kappa and The Gallup Organization (1996), many people feel that the employment of computer technology in the learning process in public schools could significantly strengthen education in America. For example, the poll reported that "there are those who feel that greater use of technology is the answer to many of the problems facing the public schools. The public expresses strong support for providing schools with access to global electronic communications systems" (Elam, et al., 1996, p. 53). This report claims that 80% of the survey's respondents think that computer technology is

either very important (41%) or somewhat important (31%). Furthermore, the report states that "teachers place computer skills alongside the three R's, hard work, citizenship, and history and geography as essentials in public school curriculum" (Elam, et al., 1996, p. 53). However, all of the excitement may be premature. After the initial rush of enthusiasm wears off, the philosophers, principals, superintendents, members of the board, teachers, parents, and students must ask the hard, nagging question: Specifically, how does the use of technology in the learning process facilitate student achievement? Perhaps the public school's present infatuation with computer technology needs to be tempered by this poignant and cogent caveat:

> Let's face it: Computers have so far had only a lackluster impact on student achievement in general. If we don't want to see the plug pulled entirely, what is needed is a far more critical and discerning attitude toward computer-based instruction.... Only when demonstrated effectiveness in improving student learning becomes the central criterion...will schools begin to redeem the true promise of educational technology. (Knickelbine, 1997, p. 71)

CHAPTER 2

PROBLEM DOCUMENTATION

Problem Evidence

To document the extent of students' technological oversimplification the researcher used a student survey (Appendix A), observation checklist (Appendix B), and document analysis of samples of students' writing (Appendix C). During the first week of school, the student survey was given to the 19 students of the targeted class. Interestingly, 84% of the students reported that they had access to a working computer in their homes. The survey also probed for students' dispositions about using computer technology to learn. Table 4 shows how students reported feeling about using computer technology to learn.

Table 4

Students' Feelings about Using Computers to Learn September 1998

Feelings	Percentage of Students
Prefer Using Computer Technology	16%
Generally Like Using Computer Technology	26%
No Preference	37%
Generally Dislike Using Computer Technology	16%
Fear Using Computer Technology	0%
Frustration	5%

N = 19

Though 37% of the students in the targeted high school indicated that, when it comes to using computer technology to learn, they had no preference, 42% of the students either preferred or generally liked using computer technology to learn. Furthermore, it is interesting to note that not a single student reported any kind of technophobia, and only one student reported feeling frustrated with using computer technology to learn. These data seem to suggest that students generally report being familiar and comfortable with computer technology. However, it should be noted that familiarity and comfort with computer technology does not necessarily imply that students utilize computers skillfully.

The survey also asked students to identify the various activities they have experienced using a computer. Table 5 is a record of students' responses.

Table 5

Students' Experiences Using a Computer September 1998

Experiences	Percentage of Students
Games	84%
Word Processor	84%
Surf the Internet	63%
Electronic Mail	42%
Power Point	42%
Made a Web Page	16%

N = 19

It is not surprising that students indicated that they have used computers to play games. However, it is interesting to note the percentage of students in the targeted class who have used word processors (84%), surfed the Internet (63%), used electronic mail (42%), used Power Point (42%), and made a web page (16%). This seems to suggest that students in the targeted group

have a relatively broad base of experience with computers. Again, it should be carefully noted that breadth of experience does not necessarily translate into the wise and skillful use of technology in the learning process. Indeed, while the data from the survey seem to indicate that students have considerable experience, comfort, and familiarity with computer technology, the data collected from the observation checklist (Appendix B) and the document analysis of students' writing (Appendix C) seem to indicate that students are not used to employing computer technology in the learning process in a skillful manner. Indeed, the data collected with these tools suggest technological oversimplification.

The observation checklist (Appendix B) was used to gauge computer literacy skills and positive student behaviors. The targeted class was given a writing prompt and asked to hand write an essay (Appendix D). In the next class period, the targeted class was taken to the computer lab and asked to convert their hand written rough drafts into a finished product using the word processors on the computers. Because the researcher wanted authentic and accurate baseline information for this study, the class was not given any instructions about how to access the word processors. Table 6 shows the computer literacy skills of the targeted class as observed by the researcher. It should be noted that if nearly all the students in the targeted class were able to perform a given skill, the class was noted as "frequently" exhibiting that skill. If about one-half of the class manifested a specific skill, the class was noted as "sometimes" exhibiting that skill. If only a few students manifested a given skill, then the class was noted as "not yet" having mastered that skill.

Table 6

Observation Checklist of Students' Computer Literacy Skills September 1998

Computer Literacy Skills	Frequently	Sometimes	Not Yet
Accessed Word Processor	X		
Used Spell Check		X	
Used Printer	X		
Saved on Disk			X
Exited Program and Computer Properly	X		

Though students were not instructed about how to access the word processor, they had very little difficulty gaining access to it. This observation supports previous data collected via the student surveys in which 84% of the students stated that they had experience using a word processor. Also, when instructed to exit the program and shut the computer down, nearly every student shut the computer down properly. This seems to suggest a familiarity with computers.

However, though students were all able to use the printer, more than a few students printed their essays without using spell check or using it correctly. That is, as the research pertaining to the document analysis will later show, some students used spell check, but they inserted the wrong word into the essay because the computer suggested the word. Consequently, some students, for whatever reasons, inserted a correctly spelled wrong word. This is a prime example of technological oversimplification. It seems that students do not question the computer or think critically for themselves. When using the computer, some students have a tendency to just click on whatever word the computer suggests--even if it is the wrong word. This particular example of technological oversimplification is not an anomaly for teachers of writing.

The observation checklist in Table 6 also shows that students in the targeted class did not save their work on a disk. The fact is that not a single student saved their essay on a disk. (The

BEST COPY AVAILABLE

work was not saved on the hard drive either.) When the researcher asked students why they did not bother to save their work on a disk, they responded by explaining that they were finished with writing the essay. This response is not necessarily an indication of technological oversimplification (i.e., they did not know how to save the information on a disk) as much as it may be proof that students may not be willing to fully engage in the tedious nature of a writing process.

The observation checklist also sought to gauge positive students behaviors in the computer lab. Table 7 shows the various behaviors the researcher sought to identify in the targeted class.

Table 7

Positive Behaviors of Students in the Computer Lab September 1998

Positive Behaviors of Students	Frequently	Sometimes	Not Yet
Cooperated with Each Other	X		
Students Stayed on Task/ Student Engagement	X		
Evidence of Positive Attitudes about Using Computers		X	
Peer-Review of Rough Drafts			X
Second Draft Attempted			X

This data seems to suggest that, on many occasions, students exhibited positive learning behaviors. For example, students stayed on task and cooperated with each other. Given the fact that high school students are often more concerned about their social life than their academic performance, it is hard to imagine a secondary educator who would not be pleased to observe the coexistence of these two often mutually exclusive behaviors (students staying on task and cooperating with each other). In addition to these positive behaviors, about one-half of the class expressed at least one positive comment about working in the computer lab. An example of this

was the students' response when the teacher informed them that they would be going to the computer lab to word process their rough drafts. Almost immediately students made statements such as "Yes!" or "Cool!" Again, a strong correlation seems to exist between what students reported on the survey (42% stated that they prefer or generally like using computer technology to learn--see Table 4) and what the researcher observed when taking the students to the computer lab. Indeed, students in the targeted class generally enjoy using the computer to learn.

However, though students seem to enjoy using the computer to learn, the data concerning peer-reviews and rewriting a second draft seem to indicate that students lack specific skills in using computers effectively to learn via the writing process. This could be another case of technological oversimplification. Perhaps students are under the misconception that because they have produced a neat looking product (a typed essay) they have handed in a quality product. To be sure, a typed paper may or may not contain quality content. Furthermore, teachers who grade essays written by students on word processors know all too well that just because something is typed it does not automatically mean that it is well written. However, technological oversimplification may not be the only reason for students' lack of effort to develop a well written essay using computers. It may be compositional oversimplification as well. That is, perhaps the students have not been trained to use computers to facilitate the process of writing quality essays because they lack an understanding of the arduous nature of the writing process. The data seem to suggest that at least one or a combination of both of these factors could be at work in the targeted class.

The final data collection tool that was used in this research to gather baseline information was the document analysis of samples of students' writings (Appendix C). Students were given a writing prompt that required higher order thinking and metacognition (Appendix D). The document analysis sought to measure students' overall ability to write deftly by analyzing three areas of writing: mechanics of writing, sentence and paragraph structure, and content. Table 8 shows the results of the document analysis of sample student essays.

Table 8

Document Analysis of the Mechanics of Students' Essays September 1998

Mechanics	Yes	No
Modern Language Association Set up	0%	100%
At Least Five Complete Paragraphs	74%	26%
Less than Three Spelling, grammar, and/or Mechanical Errors	58%	42%

N = 19

The fact that not a single student in the targeted class used the Modern Language Association (MLA) guidelines to set up their essays (i.e., margins, endorsements, double spacing, etc.) is not necessarily a major concern because at the time of this data collection the class was just beginning its high school experience. It is common for freshmen to be unfamiliar with MLA. Indeed, part of the freshmen English experience is designed to introduce them to MLA standards. However, perhaps a more significant finding is that 42% of the students had three or more spelling, grammar, and/or mechanical errors. These errors were found on the final drafts. This could be an indication of technological oversimplification and/or compositional oversimplification. It seems that students have a proclivity to be less critical, demanding, and exacting of their writing when it is produced on a word processor because of the aesthetic appeal of the printed type.

The researcher used document analysis of students' writing samples to analyze the targeted group's basic sentence and paragraphing skills as well. Table 9 shows the results of the analysis.

Table 9

Document Analysis of Students' Basic Sentence and Paragraphing Skills September 1998

Specific Writing Skill	Frequently	Sometimes	Not Yet
Used Complete Sentences	79%	11%	10%
Thesis Sentence with Preview	31%	0%	69%
Used Topic Sentences	56%	16%	28%
Used Examples to Support Topic Sentences	31%	53%	16%
Used Transitions	10%	26%	64%

N = 19

(Note: "Frequently" means nearly every time where appropriate, "sometimes" means there was some evidence that a student was at a basic skill level, and "not yet" means there was not sufficient evidence that a student had achieved a basic level for a particular writing skill.)

While a high percentage of students seemed to have at least a basic skill level of writing complete sentences, the class had a much more difficult time writing a thesis sentence that included a preview of topic sentences that would follow the thesis. Likewise, while the majority of the students were able to write topic sentences, comparably very few students used transitions to introduce the topic sentences. This data along with the rest of the data contained in Table 6 seems to offer pedagogically rich information that can be used by the researcher/teacher to improve areas of need. However, these particular data by themselves are probably more indicative of a lack of composition skills rather than technological oversimplification.

Finally, the document analysis also sought to measure the content of students' writing. Table 10 shows the results of the writing samples of the targeted class.

Table 10

Document Analysis of Content of Students' Writing Samples September 1998

Content	Frequently	Sometimes	Not Yet
Manifested Evidence of Higher Order Thinking	16%	31%	53%
Manifested Evidence of Metacognition	16%	68%	16%

N = 19

(Note: "Frequently" means nearly every time where appropriate, "sometimes" means there was some evidence that a student achieved a particular level of higher order thinking or metacognition, and "not yet" means there was not sufficient evidence that a student had achieved any level of metacognition or higher order thinking.)

When the researcher analyzed students' writing samples, he looked intently for evidence of analysis, synthesis, evaluation, and metacognition that the writing prompt required (Appendix D). Though the writing prompt required students to engage in higher order thinking and metacognition, only 16% of the students in the targeted class clearly showed in their writing that they had used higher order thinking and metacognition. Most of the students wrote obvious statements without providing a rationale for their statements. The researcher observed that the students seemed more interested in fulfilling the task of writing the essay than engaging in exploration, analysis, synthesis, evaluation, and metacognition. Again, this could be indicative of technological and/or compositional oversimplification. It could be technological oversimplification because students may simply want to use the computer to complete a task rather than engage in authentic, self-directed learning and thinking. On the other hand, the data may also indicate that many of the students in the targeted class have not been taught to engage in authentic, self-directed learning and thinking via writing.

BEST COPY AVAILABLE

These data are the basis of the following conclusions about the targeted class. First, the students in the targeted class have given a strong indication that, for the most part, they enjoy using computer technology in their learning endeavors. Indeed, these students manifest positive attitudes about using computer technology to learn. Second, when it comes to using computer technology to facilitate their learning, students exhibit signs of technological oversimplification. In particular, students seem to be unable to use computer technology to improve their writing processes or products. Third, students may not only be suffering from technological oversimplification, but they also may be lacking in terms of their understanding of the composition process in general. Last, it seems that it is incumbent upon teachers to train students to use computers effectively in their particular discipline.

Probable Causes (Site Based)

The researcher has observed multiple causes of technological oversimplification that might possibly be able to explain, at least in part, some of the problems identified above. First, it seems very few students understand how to effectively use computer technology to engage in learning. Often, it seems that students would rather use technology as a substitute for learning, not as an effective means of learning. For example, the researcher has observed students who enjoyed learning to use Power Point to put an oral presentation together. However, when the presentation was given, it was obvious that the students did not present cogent or interesting information. While the presentation included many fascinating computerized sights and sounds, the content of the presentation was shallow, uninformative, and, frankly, boring. Indeed, the students did not even bother to spell some of the words correctly. It seems that students substituted authentic learning via research and oral presentation for playing on a computer. This is a classic illustration of technological oversimplification and site based proof of the fact that students often do not understand the role computer technology can play in their education.

A second possible cause for the existence of technological oversimplification in the targeted school is that using computer technology to learn often places the student in a self- .

directing mode of operation. Indeed, such a position for some students is rather demanding. Consequently, some students are unwilling to pay the price in terms of the hard work that a student-centered environment places on them. As a teacher, the researcher has often noticed that some students dislike using computer technology to learn precisely because it places students in charge of their learning. For example, on one occasion when a student chose to do an Internet project during a unit of study based on The Tragedy of Romeo and Juliet, the student was challenged to question the credibility of some of the information he excerpted from a web page. After having several of his sources called into question by the teacher, the student responded, "I should have just written a paper and been done with it!" Indeed, this is a clear illustration of how computer technology can be used to require students to think critically and how some students have a proclivity to resist the demands that critical thinking places on them. This could account for the 21% of students who reported that they dislike or get frustrated with using computer technology to learn (Table 4).

The last possible cause of technological oversimplification has to do with teacher issues. Though the research presented here is centered on students and facilitating student achievement via computer technology, the researcher feels compelled to at least mention that some of the causes of technological oversimplification find their root in teacher issues. Indeed, when it comes to technological oversimplification, teacher issues and student issues are so interdependent, complex, and inextricably bound together that the two cannot be bifurcated without the loss of some understanding of the causes. As a teacher, the researcher knows that a considerable number of teachers at the targeted school have little or no training to use computers effectively in their teaching. Add to this the fact that some teachers who use computer technology in their teaching do not use it skillfully and suffer from technological oversimplification themselves. Exacerbating this situation is the lack of free time most teachers experience as a normal part of their teaching load. This tends to keep teachers from getting the training they need in order to use computer technology effectively in their respective disciplines.

Finally, the researcher also knows of teachers in the targeted school who are essentially opposed to using computer technology in their classrooms. Just as some students feel threatened by the shift in roles technology demands (from passive receiver of knowledge to interactive learner), some teachers also seem to be threatened by the change technology brings to their role (from dispenser of information to someone who learns along with the students). Each of these teacher complexities will undoubtedly influence student achievement in some form or another.

Probable Causes (Literature Based)

The growing number of books and specialized journals dedicated to the purpose of exploring issues related to the use of technology in education is indicative of the spirit of the times. Presently, much is being said by techno-pundits, and many more voices are rushing to enter the academic conversation that is being fleshed-out in writing. The vast amount of literature currently being generated about implementing computer technology into the classroom lucidly manifests multiple factors of causation for technological oversimplification. A large part of the current research being published concerning the implementation of computer technology in the classroom suggests a bifurcation into two major areas of concern: student issues and teacher issues.

When it comes to student issues and the implementation of technology in learning, many students do not understand the role of technology. Often, students are introduced to computer technology via computer games. According to Debra Viadero (1997), "the most frequent use that 4th graders make of computers is to play games. For 8th graders, playing games is the second most common use, behind writing papers" (p. 15). Consequently, many students perceive computers primarily as a tool for entertainment rather than education--though the two are not necessarily mutually exclusive. Thus, Viadero (1997) warns that "Teachers . . . have to be careful not to let the fun quotient overtake serious learning" (p. 13). Further evidence that students sometimes misunderstand the role of computer technology in learning can be found in a statement by technology researcher Barbara Means. Means cogently laments that some students

will spend "a whole period illustrating a color cover of a report, pixel by pixel, when they haven't even done the report yet" (as cited in Viadero, 1997, p. 13). Though many students are enthusiastic about using computers in school, unfortunately, it seems that a considerable number of students do not yet understand the broader, more important role that computer technology can play in their education.

Another problem that some students encounter when they seek to employ computer technology as a learning tool is the fact that a computer-based learning environment is primarily a self-directed/constructivist approach to education "that places the responsibility for learning on the student" (Umphrey, 1998, p. 4). Tapscott (1998), chairman of the Alliance for Converging Technologies, confirms that, in the computer-based classroom, the role of the student shifts from that of empty vessel waiting to be filled by a teacher's instruction to interactive, engaged learner. This shift can be problematic for some students because they may have been conditioned for years to function in a more essentialistic/teacher-directed learning environment. The results are often both exciting and frustrating for students. Because computer-based learning puts the student in charge of his or her learning, the student often encounters a contradictory sense of empowerment and fear. Tapscott (1998) laments the fact that more often than not, the shift in learning paradigms (from teacher-centered to student-centered) is not facilitated effectively. Though the general consensus of the pundits accentuates the virtues of the interactive learning that happens when students direct their own learning via computer technology, the fact remains that, because of years of conditioning, some students find this new approach threatening--or at least unwelcome. Indeed, the constructivist approach to learning requires students to actually be engaged in authentic higher order thinking, whereas in the essentialistic approach to education, students could often merely parrot back to the teacher whatever they thought the teacher wanted to hear or read. Thus, under this new educational paradigm, students are required to think, work, and learn where before they could simply read, take notes, and regurgitate information back to the teacher in oral or written form. Some students, it seems, are reluctant to engage in self-directed

learning via computer technology precisely because it requires them to take responsibility for their own learning.

A second major area of concern related to problems with implementing computer technology into the learning process has to do with issues related to teachers. Unfortunately, many teachers, including seasoned veterans, have had little or no training in using computers effectively in their teaching. Some teachers even suffer from technophobia--or worse yet, they are hostile toward computer technology. According to Kathleen Fulton, associate director of the University of Maryland's Center for Learning and Educational Technology, computer technology poses a special problem for teachers today: "Technology is a special case. It isn't something teachers got in their preparation. We assume teachers know about content and pedagogy, and we expect them to stay up to date in those areas. But they have not been prepared to think about how technology can enhance their teaching" (as cited in Trotter, 1997, p. 7).

Because of this lack of training, some teachers suffer from technological oversimplification. That is, they have the misunderstanding that if the school provides computers, students will automatically engage in learning. However, Stephan Marcus, co-director of the South Coast Writing Project and a researcher at the University of California-Santa Barbara, warns that "to provide a computer and think that students' writing will somehow magically improve--that's just wishful thinking" (as cited in Viadero, 1997, p. 13). Furthermore, technology coordinator Stephen Carr gives educators this caveat: "There's a real misconception that you find a piece of software, you put it on, and you let kids play on it. It is just wishful thinking that to provide computers, software, and/or connectivity that learning will magically take place" (as cited in Viadero, 1997, p. 16).

Complicating this problem is the fact that teachers are so busy with their regular teaching duties that they do not have the time for computer technology training. John D. Bransford, professor of psychology at Vanderbilt University, states that "professional development is the biggest bottleneck to the implementation of the new technology in schools, and the reason is that

teachers are so busy (as cited in Zehr, 1997, p. 26). Indeed, once teachers are certified, they are lucky if they can find the time for any training at all, let alone time for designing integrated technology lesson plans. There is a definite lack of release time for teachers planning for technology that utilizes modern approaches to teaching. Furthermore, Lockwood (1998) confirms that the greatest obstacle to teachers using computers is the lack of time for planning and incorporating such a massive innovation into their practice. So it seems that when it comes to the implementation of computer technology into the classroom, Alfred North Whitehead's words ring particularly true: "Lack of time is the rock upon which the fairest of educational schemes are wrecked" (as cited in Lorber, 1996, p. 9).

Another important issue related to teachers is the inevitable shift in the teacher's approach to teaching. In the computer-oriented classroom, the shift is from teacher-directed education to student-directed education. This is precisely where the traditional essentialistic/teacher-directed philosophy of education comes into direct conflict with the constructivistic/student-directed philosophy of education. This philosophical shift in approach to education has been less than accepted by many veteran teachers. Michael R. Haney, a program director for funding teacher training projects at the National Science Foundation, confesses that he went into teaching years ago because he "liked giving a lecture and having a stage presence" (as cited in Zehr, 1997, p. 24). Haney posits that "We're taking teachers and trying to transform them into something very different than what they signed up for" (as cited in Zehr, 1997, p. 24). Since the employment of computer technology demands that teachers venture away from the traditional, familiar lecture, many veteran teachers immediately feel uncomfortable. Haney further explains his initial frustration with using computer technology in the classroom when he explains, "There was nothing about my [teacher] training that taught me how to have kids go in eight different directions" (as cited in Zehr, 1997, p. 24). Zehr (1997) concurs with Haney and makes it extremely clear when she writes, "Teachers who use technology also must learn how to manage their classrooms differently. They need to become comfortable with different students doing

BEST COPY AVAILABLE

different activities at the same time . . ." (p. 24). The question is whether or not veteran teachers will make the change from lecturing teacher to the guide-on-the-side of the student.

Implementing computer technology into the classroom is not a problem-free task. In fact, employing computer technology in education has created some new, but some would argue, worthwhile problems. As the maxim goes, "You get to pick your problems. You do not get to pick to be problem-free." If computer technology is to be used effectively in education, students and teachers must learn to successfully negotiate the challenges that computer technology presents to them.

CHAPTER 3

THE SOLUTION STRATEGY

Literature Review

The sheer volume of up-to-date literature has made the task of reviewing the literature on the impact of technology on student achievement both easy and difficult. Finding a technology expert who was willing to share an opinion on the subject at hand was as easy as walking to the school mailbox and sorting through the myriads of journals dedicated to educational technology or doing a simple search on the Internet. However, the volume of articles, journals, and books turned out to be a two edged sword: sorting, classifying, and finding usable material for this project was all the more cumbersome precisely because of the volume. In addition, so much information about the employment of technology in education is currently being discussed that without a constant attempt to keep up with the discussion, one could easily find that relatively "new" ideas quickly become passé. At this point, it is difficult to resist thinking of the researcher as a swimmer trying to keep from drowning in a sea of literature. Wave after wave of documents bring more and more information for the weary researcher to negotiate. The nature of this inundation of literature about computer technology is representative of the current prolific state of technology in our culture.

While the current literature is indeed vast and often unruly, the current zeitgeist of the writing dedicated to implementing computer technology into education is strongly optimistic. At this time, America is riding a strong wave of support for employing computer technology in schools. This is not to say that educational technology does not have its opponents and doubters. However, they currently have a small and relatively insignificant voice in the present academic

conversation being conducted via books, articles, and journals. It is probably more accurate to say that at this time in America the two biggest schools of thought concerning the pedagogical value of technology are not those who believe that computer technology enhances learning and those who do not, but, rather, those who are openly endorsing the use of computer technology as an important tool in the learning process and those who are cautiously optimistic about how technology is implemented in the educational system.

In the literature, everyone, it seems, offers solutions to the problems that computer technology creates in educational settings. It is common to find almost euphoric anecdotes about how schools are successfully using computer technology in the learning process. Consequently, a number of technology experts have cogent solutions to offer. The following solutions are offered in the context of the specific problems that have already been raised at the end of chapter two concerning student issues and teacher issues.

Since some students do not understand the broader, more important role of technology in learning, they must be systematically trained to understand the role of technology in learning. Indeed, Viadero (1997) stressed the fact that students must be challenged to think of using computer technology to learn rather than solely as a means of entertainment. In Learning with Technology, Margaret B. Tinzmann and her colleagues (1997) concurred with Viadero that computer technology in the classroom offers students rich opportunities to enhance learning. Furthermore, Tom King (1997), editor of Technology in the Classroom, believed that though technology alone could not make learning success happen, he did not believe that learning success could happen very well unless students had access to the technological tools they needed. He posited that computer technology was an empowering tool that encouraged students to engage in authentic learning. While employing computer technology is clearly not a panacea for pedagogical pathologies, it is an effective tool for learning and all students should be well-aquatinted with any tool that helps them to learn. Therefore, students must be challenged and trained to think of computer technology as a learning tool, not as a tool solely for entertaining

themselves.

One possible solution to helping students understand the role of computer technology is to show them how computer technology can prepare them for future employment. According to International Business Machines employee and consultant Harvery Long (as cited in Szabo and Hotch, 1993, p. 1) at least 85% of all current jobs involve technology. This kind of pertinent information screams for the attention of educators and strongly appeals to students' seemingly innate need for an education that is relevant and up-to-date. In the 1998 edition of Learning with Technology, educational reformers Robert Kozma and Patricia Schank boldly echo Long's sentiments when they stated that

> Students will need to acquire a new set of skills. They will need to be able to use a variety of tools to search and sort vast amounts of information, generate new data, analyze them, interpret their meaning, and transform them into something new. They must have the ability to see how their work fits into the larger picture, to understand how the pieces work together and to assess the consequences of any changes. They must develop the capacity to work with others to develop plans, broker consensus, communicate ideas, seek and accept criticism, give credit to others, solicit help, and generate joint products. (as cited in Dede, 1998, p. 4)

The exciting fact is that infusing computer technology into the learning process can facilitate the internalization of the specific skills mentioned by Kozma and Schank. However, for students to perceive computer technology from this broader, more enlightened vantage point, they must be trained to see the computer not merely as a means of entertainment, but primarily as a means of learning. Eric Hoffer (as cited in King, 1997) cogently argued that only the learners, not the learned, will inherit the future.

Employing computer technology in the learning process also enables many students to take personal responsibility for their own education. While such a proposition strikes fear in the hearts of some students, many others, it seems, welcome the opportunity to take ownership of

their learning. Tapscott (1998) wrote that many in the generation of children growing up in the computer revolution actually prefer to use computer technology as a tool for learning. In addition, Umphrey (1998) noted that the modern learning environment that many new educational software programs help create in schools requires the student to take charge of his or her own learning. According to Viadero (1997), when students move from passive listener to active, engaged learner using technology to process information, student motivation soars. For the most part, the current literature is strongly optimistic about the fact that students who use computer technology in the learning process are self-directed students who are taking responsibility for and ownership of their education. The current literature seeks to substantiate the connection between the use of computer technology and student motivation to learn via anecdotal evidence.

In regard to teacher issues, technology experts are quick to offer multiple solutions. It would be difficult to find anything in the current literature that does not accentuate the need for teacher training. Indeed, technology pundits almost universally agree that teacher training is absolutely basic and critical to the successful implementation of computer technology in classrooms. According to Zehr (1997), at least 30% of a school's technology budget should be spent on training for teachers to use computer technology effectively in their classrooms. Zehr further argued that teacher training was most successful when it offered hands-on learning opportunities to explore and when teachers had easy access to equipment and people who could explain how to use computer technology well in the classroom. Clearly, teacher training, in order to be successful, must be extremely practical and readily available. Furthermore, Zehr pointed out that for teacher training to be truly effective teachers must be involved in planning the training. However, in the real world where the public measures every dollar spent by schools, many schools do not enjoy the luxury of being able to spend 30% of the technology budget on staff development. Add to this the fact that teachers are already pressed to find time for many legitimate educational endeavors and the result is often little or no real effective training for teachers. Nonetheless, Trotter (1997) agreed with the pundits: teacher training is not an option

for schools that are serious about successfully infusing computer technology into the learning process. Because teachers stand in the gap between students and the use of computers in the learning process, they will either facilitate or complicate the successful integration of computers in education. Therefore, the literature is pregnant with advice and solutions about how to train teachers to use computer technology successfully in their classrooms.

Another solution offered in the literature in regard to teacher issues has to do with helping teachers cope with the necessary change from the teacher-centered/essentialist approach to teaching to a student-centered/constructivist approach. In Technology-Based Learning: A Handbook for Teachers and Technology Leaders, Tweed Ross and Gerald Bailey (1996) waxed eloquent when they referred to the fact that the role of the teacher in a technology-rich environment must necessarily shift from being the "sage-on-the-stage" to being the "guide-on-the-side" (p. 22). Zehr (1997) argued that some teachers are simply not willing to make this kind of change in their approach to teaching. Nevertheless, those teachers who are willing to change must embrace at least three different non-traditional teaching roles that Tinzmann and her colleagues (1997) have identified: facilitator, guide, and co-learner/co-investigator. As a facilitator, the teacher's task is to facilitate learning by creating an environment in which students can solve problems, do authentic tasks, and collaborate. As guides, teachers are involved in mediation, modeling, and coaching, especially as students begin their inquiry. As co-learners and co-investigators, teachers are involved in learning right along side of the students. When teachers change their functional educational philosophy to what has been described above, then many of the pundits in the current literature state that these teachers will be in a position to use computer technology effectively in their classrooms.

The subsequent action plan clearly demonstrates a shift in functional educational philosophies (from essentialism to constructivism) that teachers must negotiate if they desire to implement technology effectively in their classrooms. The action plan accentuates key tenets of the constructivist approach to teaching and learning as outlined by Books and Brooks (1993).

For example, the first step in the action plan calls for the teacher to gather baseline data. The primary reason for this first step is so that the teacher may facilitate students' learning. Indeed, it behooves the teacher to gather baseline data so that he might be able to intelligently create a learning environment where students can function as inquirers and construct their own knowledge (Joyce and Weil, 1996). Furthermore, the following action plan calls for the teacher to function as a guide. The action plan calls for the teacher to guide students in a self-directed learning journey using technology to achieve specific content objectives. The computer lab serves as the location in which the teacher guides students by modeling and coaching students as they employ various aspects of technology to learn. Finally, the action plan shows that the teacher is co-learner with the student. The fact is that the action plan is designed to help the teacher learn how to effectively help students achieve via computer technology. The action plan calls for the teacher to write reflective logs and to gather post-intervention data so that the teacher can gain insights into teaching, students, and using technology in the learning process. Clearly then, the action plan, though it contains some elements of essentialism (i.e., direct instruction), is rooted in constructivism

Without a doubt, the infusion of technology into the American classroom creates new problems. Nevertheless, there is a plethora of literature about how to solve virtually every problem that could possibly be encountered. The literature about employing computer technology into classrooms is saturated with solution-oriented articles and books. What remains to be seen is whether or not the following action plan and interventions can remedy the problems identified with students' technological oversimplification. However, since the action plan is a byproduct of the researcher's overall objectives for this research project, the stated objectives and processes precede the details of the action plan.

Project Objectives and Processes

As a result of increased instructional emphasis on quality essay writing and infusing the skillful use of computer technology into the learning process, during the period of September 1, 1998 to February 1, 1999, the ninth grade students of the targeted class will increase their ability to deftly employ technology to compose quality essays, as measured by surveys, observation checklists, document analysis of essays, and interviews.

In order to accomplish the project objective, the following processes are necessary:

1. The direct instruction of computer literacy and application skills and in-class opportunities for students to master the skills via guided practice in the computer lab.
2. The direct instruction of a writing process with training in peer-editing and in-class opportunities for students to master the skills via guided practice.
3. The explicit teaching of higher order thinking skills with special application to composition using computer technology.

With the project objectives and processes clearly identified, the following action plan has been developed with the ultimate goal of helping the researcher achieve the stated objective.

Project Action Plan

I. Gather baseline data for evidence of the problem (September)
   - A. Explain to students and parents the nature of the thesis research so that they are informed and assured of anonymity
   - B. Survey students' attitudes about using technology to learn (Appendix A)
   - C. Assign essay to students (Appendix D) and use rubric (Appendix C) to analyze the mechanics and content of the essays
   - D. Take students to computer lab to record their responses and activities on the observation checklist (Appendix B)

E. Collate and organize data and write a reflective log summarizing baseline results

II. Introduction of learning activities and instructional interventions (ongoing--September through October)

A. Teach computer literacy skills in the computer lab and provide opportunities for guided practice (one 85 minute class period)

1. Accessing word processor
2. Using spell check
3. Using the printer
4. Saving document on a disk
5. Exiting the program correctly

B. Introduce students to the Modern Language Association (MLA) standards and endorsements (one 85 minute class period). Provide opportunities for guided practice (two times throughout the months of September and October)

1. Endorsements
2. Margins
3. Page numbers
4. Font size
5. Font type

C. Instruct students on writing process (one 85 minute class period) and provide guided practice (two times throughout September and October)

1. Prewriting activities
    a. Topic discovery
    b. Turning topics into subjects
    c. Creating mind maps
2. Organization
    a. Introduction

b. Thesis sentences with a preview

c. Topic sentences for body paragraphs

d. Support via examples for topic sentences

e. Clincher sentences

f. Transitions

g. Conclusion

3. Writing of the first draft

4. Evaluation

a. Using the rubric and outline for self evaluation

b. Peer-review

c. Grammar, spelling, and mechanics evaluation

5. Revisions

D. Have students read model essay (one 85 minute class period)

1. Accentuate important structures, devices, and writing techniques of quality essay writing

2. Explain rubric for grading essays (Appendix C)

3. Have students use rubric to evaluate model essay and their own essays

4. Handout outline of ideal essay

E. Teach higher order thinking skills (analysis, synthesis, and evaluation) and show how to use higher order thinking skills to support thesis and topic sentences (one 85 minute class period). Provide opportunities for guided practice (two times throughout September and October).

III. Provide at least three opportunities for students to practice and master the above via essay writing that will be integrated in various units of study (October through December).

IV. Gather post-learning activities data (December-January)

A. Survey of students' attitudes concerning using technology to learn

B. Assign essays to students and use rubric to analyze the mechanics and content

C. Take students to computer lab to record their responses and activities on the observation checklist

D. Conduct post-interview with low achieving students (Appendix E) about their experiences and attitudes concerning the use of technology in learning

V. Write reflective log comparing and contrasting post-data results with baseline data results accentuating major points (December through January)

VI. Write about observations and findings in thesis (February through March)

VII. Revisions of thesis (April)

Methods of Assessment

In order to assess the effects of the interventions, samples of students' writing will be analyzed via a teacher-made scoring rubric. These writing samples will be kept in portfolios by the teacher. Furthermore, surveys, interviews, and observation checklists will also be used as a part of the assessment process.

CHAPTER 4

PROJECT RESULTS

Historical Description of the Intervention

The objective of this project was to increase students' writing skills by infusing computer technology into the composition process. In order to accomplish this objective, students of the targeted class were explicitly taught specific characteristics of deft essay writing and then given opportunities for guided practice. Because the targeted class is enrolled in freshmen English, the students were engaged in developing essay writing skills at least on a weekly basis. Only on one occasion was an entire class period used for essay instruction. Since the targeted school employs 85 minute blocks of time per class, students were engaged in essay writing for only portions of the majority of class periods. For portions of ten class periods, students were exposed to one or more of the following skills or concepts: the Modern Language Association standards; paragraph theory; the elements of a thesis; thesis positioning; model Illinois Goal and Assessment Program essays; components of writing processes; and were taught, in the context of composition, the various higher order thinking skills as explained in Bloom's Cognitive Taxonomy. Once students had been exposed to and had an opportunity to increase their ability to utilize a specific skill or concept, they were expected to use it as a foundation on which they could build new skills and concepts. For example, once students were taught and experienced in how to set up a paper according to Modern Language Association standards, every essay from that point in time was required to be formatted by the standards. This phase of the intervention ended with students being given a writing prompt (Appendix D), and then they were asked to respond by hand writing an essay. All work students engaged in was accomplished during class time.

Next, students in the targeted class were taken to a computer lab, instructed in basic computer literacy skills, and then given opportunities for guided practice. The students were taken to the lab during class time. While students had access to the computer lab throughout the entire semester, the time for instruction in basic computer skills during class time was limited to one entire class period and portions of two classes. Students were taught how to access a word processor, how to format a page according to Modern Language Association standards, how to utilize spell check, how to print a document, how to save information on a computer disk, and how to exit a program correctly. Using the previously hand written rough draft of their essays, students then endeavored to employ their newly acquired word processing skills to produce a new, improved second draft of the essay. Once these word processed drafts were completed, students were instructed in how to engage in peer-review with each other. All of this training and exposure to computer technology and quality essay writing took place from the first week in October to the first week of November.

Once students were able to synthesize basic computer skills and basic essay writing skills on an introductory level, they were given a total of three opportunities to work in class and/or at the computer lab to develop and master these skills via guided practice. At this stage in the intervention, students wrote essays and then worked together doing peer-reviews on each others' essays. Students were given rubrics (Appendix C) to assist them in identifying key components of an essay. Students used these rubrics to evaluate their own essays and the essays written by their peers when they engaged in peer-review activities. Opportunities to correct and improve drafts of essays were given as students had multiple opportunities to access the computer lab. As a result of this period of practice and evaluation, students gained considerable experience in using computer technology to write essays. This particular part of the intervention took place during the last three weeks of November.

Once students had gained some experience in writing quality essays and with basic word processing skills, they were asked to write a final essay as the last step in the actual intervention.

Students were given the same writing prompt that was used to gather the baseline data for this study (Appendix D). The same writing prompt was used primarily because the researcher thought the processes of analyzing, comparing, contrasting and evaluating the two essays would be facilitated by having students write two essays generated from the same writing prompt. So, the same writing prompt was used to generate the baseline essay that was written before any instruction occurred, and the final essay was generated by the same writing prompt. This seemed to be an efficient way to determine whether students manifested growth, no change, or a reduction in writing skills. Hence, as the last step in the actual intervention, students had the opportunity to write a rough draft of the essay, engage in peer-review of each other's drafts, and then use a word processor in the computer lab to create the final draft. After students finished the essay, the researcher interviewed five lower achieving students to gather data about how they perceived using technology to learn (Appendix E).

Lest the above chronology and description of the intervention mislead the reader, it should be noted that all of the different elements of the intervention were taught in the context of the regular curriculum of the targeted ninth grade English class. That is, the intervention did not serve as the sole agenda of the curriculum--even during the time the intervention was being implemented. However, since the development of writing skills is an integral and seminal component of the targeted school's ninth grade English curriculum, the intervention served to facilitate the teaching that was already happening in the class. For example, during a unit on novels (a core component of the regular English curriculum in the targeted high school), students were asked to write essays (an essential component of the intervention and the regular core curriculum) about the novels they were already engaged in reading. Presenting the intervention within the context of the already existing curriculum, as opposed to making the intervention the sole curriculum, was advantageous primarily because it offered students an opportunity to compose essays as a byproduct of their reading activities, thus offering them some diversity and relief from just simply focusing on developing writing skills.

BEST COPY AVAILABLE

Presentation and Analysis of Results

In order to assess the effects of infusing computer technology into the composition process, the survey that asked students about their attitudes concerning using computers to learn (Appendix A) was re-administered. This was done to determine if the intervention, the actual experience of utilizing computer technology to write essays, had any effect on students' attitudes about using computers to learn. The premise and assumption was that attitude, to some degree, would be a significant influence one way or another on student achievement. Table 11 below contains both the baseline and post intervention data gathered from students concerning their attitudes about using computer technology in the learning process.

Table 11

Students' Feelings about Using Computers to Learn September 1998 and January 1999

Feelings	Pre-Survey % of Students	Post-Survey % of Students
Prefer Using Computer Technology	16%	39%
Generally Like Using Computer Technology	26%	33%
No Preference	37%	22%
Generally Dislike Using Computer Technology	16%	6%
Fear Using Computer Technology	0%	0%
Frustration	5%	0%

Pre-N = 19

Post-N = 18

A comparison of the two sets of data clearly demonstrates that between September of 1998 and January of 1999 students' attitudes increased positively concerning the utilization of computer technology as a means for learning. Table 11 shows that 72% of the students surveyed in January

of 1999 indicated that they preferred using computers to learn or that they generally liked using them, whereas in September of 1998 only 42% indicated such positive attitudes about using computer technology to learn. In September, 58% of the students indicated that they had either no preference for using computer technology or a negative attitude of one kind or another about using it. Then, in January, only 28% of the students indicated that they had no preference (22%) or disliked using computers (6%) as a learning tool. This could be accounted for, at least in part, by the fact that during the intervention students had more opportunities to become familiar with computer technology, and, as a result, grew to enjoy employing computer technology to learn. Indeed, when people lack the knowledge and skills necessary to use computers appropriately and effectively, they often experience an apprehension and an anxiety about using them. However, once a certain level of familiarity and mastery is achieved, the process of utilizing computer technology as a learning device can even become enjoyable. Another factor that possibly contributed to this increase in positive attitudes about using computers as a tool to write well is the fact that the targeted school changed the curriculum for freshmen to include a mandatory computer applications course. While not all of the students in the targeted class took the course during the time of the intervention, at least half of the students did. A third possible contributing factor to the positive increase in students' attitudes about using computers to learn is the proliferation of personal computers in American homes. In September of 1998, 84% of the targeted class indicated that they had access to a working computer in their homes. In January of 1999, 94% of the targeted class indicated that they had access to a working computer in their homes. While the targeted class may have a higher percentage of home computers, the fact is that the entire American society is becoming more and more familiar and comfortable with computers via the proliferation of the home computer. While there are still some holdouts, often with older adults, even many technophobic adults seek to provide home computers for their children because they realize the important and increasing role computers play in the future of their children.

The same survey (Appendix A) also asked students about specific ways in which students

have used computers. Table 12 shows how students responded in September of 1998 and how the same group of students responded in January of 1999.

Table 12

Students' Experiences Using a Computer September 1998

Experiences	Pre-Survey % of Students	Post-Survey % of Students
Games	84%	94%
Word Processor	84%	100%
Surf the Internet	63%	72%
Electronic Mail	42%	50%
Power Point	42%	56%
Made a Web Page	16%	16%

Pre-N = 19

Post-N = 18

Clearly, students show growth in terms of their experiences in using computers. A comparison of the data sets shows an increase in students' experiences with computers except where making a Web page is concerned. However, with recent software developments that make creating a Web page without the knowledge of computer language possible, one can only wonder how many students in the targeted class will go on to create their own Web pages before they graduate from high school.

Again it should be noted that breadth of experience does not necessarily translate into the wise and skillful use of technology in the learning process. However, the intervention seems to have had some positive impact on students' abilities to employ computer technology wisely and

skillfully. Table 13 represents the observations of the researcher in September of 1998 and in January of 1999. It should be noted that if nearly all the students in the targeted class were able to perform a given skill, the class was noted as "frequently" exhibiting that skill. If about one-half of the class manifested a specific skill, the class was noted as "sometimes" exhibiting that skill. If only a few students manifested a given skill, then the class was noted as "not yet" having mastered that skill.

Table 13

Observation Checklist of Students' Computer Literacy Skills Sept. 1998 and Jan. 1999

Computer Literacy Skills	Frequently		Sometimes		Not Yet	
	Pre	Post	Pre	Post	Pre	Post
Accessed Word Processor	X	X				
Used Spell Check		X	X			
Used Printer	X	X				
Saved on Disk		X			X	
Exited Program and Computer Properly	X	X				

The post intervention observation checklist seems to indicate that students in the targeted class became more cognizant and skillful in their abilities to utilize computer technology in the learning process. Whereas the baseline data shows that students did not always use spell check and that most of the students did not bother saving their work on a computer disk, the post intervention data shows that both of these computer skills were used by more of the students.

However, upon further analysis of students' essays, the researcher noted that while the majority of the students sought to apply spell check to their essays, on occasion a few students did not use spell check skillfully. For example, when spell check identified an incorrectly spelled word and offered several alternative words that were similar to the misspelled word, some

students replaced a misspelled word with a word that was spelled correctly but was not the correct word for the sentence. There are at least three possible explanations for this type of mistake. First, some students may have academic deficiencies in their knowledge of spelling. Second, some students may be too lazy to actually take the time to look in a dictionary for the word they need, and so they simply just pick a word that the computer suggests without thinking about the word. Third, some students may be exhibiting signs of technological oversimplification. That is, they assume that because the computer suggests a word, it must be the correct word. So, while the majority of the students in the targeted class clearly show signs of increased willingness to utilize computer literacy skills such as utilizing spell check, some students still need to be taught to use it in a deft and efficient manner.

The post intervention observation checklist also sought to gauge students' positive behaviors while in the computer lab. Table 14 shows the baseline and post intervention data the researcher collected concerning positive behaviors the students exhibited using computers in the computer lab.

Table 14

Positive Behaviors of Students in the Computer Lab September 1998 and January 1999

Positive Behaviors of Students	Frequently		Sometimes		Not Yet	
	Pre	Post	Pre	Post	Pre	Post
Cooperated with Each Other	X	X				
Students Stayed on Task/ Student Engagement	X	X				
Evidence Positive Attitudes about Using Computers		X	X			
Peer-Review of Rough Drafts				X	X	
Second Draft Attempted				X	X	

These data seem to suggest that the targeted class, which had already exhibited basic positive

learning behaviors such as cooperative learning and staying on task while in the computer lab, showed continued improvement. For example, in the baseline data phase, the majority of students did not bother with doing peer-reviews or attempt to compose a second draft, whereas in the post intervention stage, about half of the students attempted peer-reviews or a second draft. This improvement may be attributed to the fact that part of the intervention specifically addressed the writing process and the need for peer-review and second drafts as an integral and essential part of the process.

Another data collection tool that was implemented to gather post intervention information was a document analysis of students' writing. Table 15 shows the document analysis of the mechanics of students' baseline and post intervention essays.

Table 15

Document Analysis of the Mechanics of Students' Essays September 1998 and January 1999

	Pre	Post
Mechanics	Yes	Yes
Modern Language Association Set up	0%	100%
At Least Five Complete Paragraphs	74%	100%
Less than Three Spelling, Grammar, and Mechanical Errors	58%	100%

Pre-N = 19

Post-N = 18

In terms of writing mechanics, the intervention seems to have been effective. Since the students in the targeted class are enrolled in a freshmen English course, it seems reasonable that after being given multiple opportunities to master some of the basic mechanics of writing that students would be able to do well. However, the exact role that technology played in this increase in writing ability is difficult to ascertain because the intervention blended instruction on skillful composition

with the infusion of computer technology into the writing process. What can be safely stated is that students were taught both computer skills and essay writing skills and the results suggest that these variables may have been factors in student achievement.

The researcher also sought to analyze students' basic sentence structure, paragraphing and essay writing skills. Table 16 represents the baseline and post intervention document analysis of students' basic sentence, paragraphing, and essay writing skills.

Table 16

Document Analysis of Students' Basic Sentence and Paragraphing Skills Sept. 1998 and Jan. 1999

Specific Writing Skill	Frequently		Sometimes		Not Yet	
	Pre	Post	Pre	Post	Pre	Post
Used Complete Sentences	79%	100%	11%	0%	10%	0%
Thesis Sentence with Preview	31%	100%	0%	0%	69%	0%
Used Topic Sentences	56%	100%	16%	0%	28%	0%
Used Examples to Support Topic Sentences	31%	61%	53%	33%	16%	6%
Used Transitions	10%	78%	26%	16%	64%	6%

Pre-N = 19

Post-N = 18

The comparison of the baseline and post intervention data suggest considerable increase in students' essay writing skills. For example, in January of 1999, all of the students in the targeted class used complete sentences throughout their essays and topic sentences when beginning new paragraphs. However, the data seem to indicate that students significantly improved in their abilities to write a thesis sentence with a preview and to use transitions. Indeed, in September of 1998, only 31% of the students used thesis sentences with a preview, while a mere 10% used transitions. Then, in January of 1999, after being instructed in skillful essay writing and given the

chance to practice what they learned, 100% of the students wrote a thesis with a preview and 78% used transitions. This major increase in these particular essay writing skills is precisely what the instructor hoped to develop in students because the freshmen English course of the targeted school is designed to prepare students for an intense sophomore composition course. The data also suggest that, though students seemed to show considerable improvement, the greatest area of need in terms of students' writing skills is the ability to elaborate and use examples to support topic sentences.

Another area of concern the researcher wanted to explore and sought to measure was the content of students' writing. The researcher analyzed students' writing samples to look for evidence of higher order thinking and metacognition. Because of the reflective nature of the writing prompt, students were essentially required to engage in higher order thinking and metacognition. Table 17 shows a comparison of the baseline data gathered in September of 1998 and the post intervention data gathered in January of 1999.

Table 17

Document Analysis of Content of Students' Writing Samples September 1998 and January 1999

Content	Frequently		Sometimes		Not Yet	
	Pre	Post	Pre	Post	Pre	Post
Manifested Evidence of Higher Order Thinking	16%	72%	31%	17%	53%	6%
Manifested Evidence of Metacognition	16%	94%	68%	6%	16%	0%

Pre-N = 19

Post-N = 18

These data seem to strongly suggest that, after instruction and practice, students began to write with a depth and quality that did not previously exist. For example, in September of 1998 when students were asked to study their eighth-grade English portfolios and evaluate the learning the

portfolios were supposed to show, students often responded that they enjoyed their assignments or that they "learned a lot." However, very few of the students reflected on the processes they were involved in as they produced the products in their portfolios, and even less manifested such higher order thinking skills as analysis, synthesis, or evaluation. Then, in January of 1999, after considerable instruction on how to implement higher order thinking in their writing, students began to look beyond the products in their portfolios to include processes; they began to move from simplistic statements toward higher order, reflective explanations. For example, many students criticized the writing in their portfolios by pointing out specific areas for improvement. It is important to note that when students are engaged in constructive criticism, they are engaged, to some degree, in evaluation. According to Bloom, evaluation is the highest level of thinking because it requires the evaluator to specify the criteria for the evaluation and then use the criteria in the evaluation process. For example, one student pointed out that his portfolio lacked depth, creativity, and mechanical polish. Then he proceeded to elaborate on his lack of depth, creativity, and polish by giving examples from his junior high portfolio. Indeed, by engaging in honest criticism of his writing, this particular student engaged in higher order thinking and metacognition. This sort of reflective writing was prevalent in the majority of students' post intervention essays.

The final area of exploration for the researcher concerned the way in which lower achieving students viewed and used technology in the learning process. The researcher used interview questions (Appendix E) that required students to explain their viewpoints and opinions. Out of the targeted class, a total of five students were interviewed. Two students enjoyed using computers to learn, one student did not have a preference, and two students did not like using computers to learn. The students who enjoyed using computers in the learning process pointed out that computers offered them a chance to accomplish more in a short amount of time, learn at their own pace, and take a break from teachers who often lecture. Consequently, they favored and enjoyed using computers to learn. The students who embraced a more critical view of utilizing computer technology to learn talked about being frustrated by computers. Indeed, one of

the students, when asked about what advice she would give to teachers about helping students use computer technology to learn, gave this poignant response: "Be aware that not all students can use computers to learn." While there are multiple factors inherent in the frustration and reticence in this student's response, it nonetheless shows that, even though the current zeitgeist in American education can be characterized as a love affair with computer technology, not all students are happy about the relationship. It could also be indicative of a lack of training as to how to use computer technology effectively. Whatever the cause of the frustration and apprehension on the part of some lower achieving students, it is important to note that not all students, including lower achieving students, are eager to use computer technology to learn.

Conclusions and Recommendations

Based on the presentation and analysis of the data on infusing computer technology into the composition process, the students showed a marked improvement in their ability to effectively synthesize computer technology and the composition process. That is, the intervention seems to have had a positive impact on students' abilities to use computer technology to write in a relatively skillful manner. Through regular interaction and usage of computers in the learning process, students' attitudes about utilizing computer technology in the learning process seems to have improved on an already generally positive perspective. The data also seem to indicate that more students are able to utilize computers for a wider variety of educational purposes such as investigating resources on the Internet and planning and presenting power point presentations. The intervention seems to have been effective in helping students develop basic computer literacy skills such as using spell check, saving information on a disk, and exiting the computer program properly. As a result, one of the most noticeable changes has been that students' behaviors in the computer lab have been largely positive and productive as evidenced by the majority of students who stay on task and engaged in the learning process. The students of the targeted class also showed signs of increased development and enhancement of specified writing skills such as skillfully engaging in peer-review, attempting to revise rough drafts, implementing the Modern

Language Association standards, using complete sentences, writing a thesis with a preview, and using topic sentences. The increase in development also manifested itself in students' writing. Indeed, after the intervention, there was a marked increase in evidence of higher order thinking and engagement in metacognition in students' writing.

Perhaps the most practical and important point the researcher can make about infusing computer technology into the writing process is the fact that the teacher must understand the role and function of technology in learning. It will never be enough to simply take students to a computer lab, sit them in front of a computer, and hope and pray that learning takes place. This is technological oversimplification in its full glory. The primary reason the researcher believes that the students in the targeted class showed increased signs of composition and computer skills is because he painstakingly took the time to teach students a step by step writing process and a step by step approach to accessing computer technology. Without this specific type of teaching, it is doubtful that students will be able to achieve academically in any significant way.

While the researcher is extremely pleased that the intervention had such a positive effect on the targeted class, he would offer the following pieces of advice to other researchers who may be so inclined to investigate the role of computer technology in the composition process. First, future researchers may want to simplify their research by focusing on either the writing process or the use of computer technology in learning. By pinpointing one of these variables for research, as opposed to focusing on the two variables as presented in this research project, the nature of the conclusions of the research may be more objective and concrete. For example, by studying the effect of two interacting variables, instruction on writing and the effective usage of computer technology, the researcher has documented a positive increase in both areas, but, because of the two variables, he is unable to specify the actual reasons for the positive increase. Indeed, a clear, positive relationship appears to exist between the intervention and the post data, but, because the variables were highly interactive and studied together, the researcher is unable to pinpoint the degree in which the instruction on writing increased student achievement. Therefore, future

researchers may want to consider isolating the variables of their study.

Second, future researchers may want to investigate more fully how lower achieving students view using computer technology in the composition process. This research project was not specifically designed to focus primarily on lower achieving students in particular, but the interview with lower achieving students was included in this research to round out the study by getting a basic feel on the perspectives of lower achieving students about using computer technology in the learning process. While the data collected from lower achieving students for this research project served the researcher's purposes well, it is insufficient, in terms of quantity and quality, to make any conclusive generalizations. Hence, future researchers may want to investigate specifically the infusion of computer technology in helping lower achieving students to write skillfully. The current research suggests that lower achieving students enjoy and can use computer technology to learn effectively. Perhaps, by focusing on using computer technology to help lower achieving students develop their writing skill, researchers may discover some new pedagogical depths to plumb.

Last, future researchers may want to replicate this research project for the purpose of testing its reliability. Since it is likely that schools will only increase the ways in which they implement computer technology in the classroom, it seems that teachers may want to research its effectiveness in helping students to write in a deft manner. Indeed, if the proper and skillful use of computer technology does not facilitate student achievement in the basic academic skills of the core curriculum, which should be focused on preparing students for the competitive world of the next century, educators should reconsider their usage of computer technology. Indeed, if educators do not research the role and effect of computer technology on student achievement, the public will ultimately, and rightly so, demand some sort of evidence of academic progress for all of the money they have invested in computers for schools.

References

Brooks, J. G., & Brooks, G. M., (1993) The Case for the Constructivist Classrooms. Alexandria, VA: Association for Supervision and Curriculum Development.

Dede, C. (1998). Learning with Technology. Alexandria, VA: Association for Supervision and Curriculum Development.

Elam, L. M., Rose, L. C., & Gallup, A. M. (1996, September). The 28th annual Phi Delta Kappa/Gallup poll of the public's attitudes toward the public schools. Phi Delta Kappan, 78 (1), 41-59.

Fulton, K. (1998, February). Learning in a digital age: Insights into the issues. T. H. E. Journal, 25 (7), 60-63.

Joyce, B., & Weil, M., (1996) Models of Teaching. Needham Heights, MA: Allyn & Bacon.

King, Tom. (1997). Technology in the Classroom. Arlington Heights, IL: IRI/Skylight.

Knickelbine, L. (1997, September). We must aim higher. Technology and Learning, 18 (2), 71.

Lockwood, A. (1998, Winter). Technology and educational transformation. New Leaders for Tomorrows Schools, 5 (1), 7.

Lorber, M. A. (1996). Objectives, Methods and Evaluation for Secondary Teaching. Needham Heights, MA: Allyn.

Ross, T., & Bailey, G., (1996). Technology-Based Learning: A Handbook for Teachers and Technology Leaders. Arlington Heights, IL: IRI/Skylight.

Szabo, T., & Hotch, R. (1993, December). How high tech works in schools. Nation's Business, 12 (4), 65-66.

Tapscott, D. (1998, July). Kids, technology, and the schools. Computer World, 32 (27), 32.

Tinzmann M. B., Rasmussen C., Foertsch M., McNabb M., Valdez G., and Holum A., (1997). Learning with Technology. Oak Brook, IL: North central Regional Educational Laboratory.

Trotter, A. (1997, November). A test of leadership. Education Week, 12 (11), 30-33.

Umphrey, J. (1998). Bringing technology into the curriculum. Alliance, 2 (4), 1-8.

Viadero, D. (1997, November). A tool for learning. Education Week, 12 (11), 12-13, 15, 16-18.

Viadero, D. (1997, November). Putting it all together. Education Week, 12 (11), 16

Zehr, M. (1997, November). Teaching the teachers. Education Week, 12 (11), 24-29.

Appendices

Appendix A

Survey of Student Attitudes Concerning the Use of Computer Technology in Learning

Directions: Circle the correct answer for each response.

1. Do you have a working computer at home?

   a. Yes b. No

2. Which of the following best describes your feelings about using computers to learn?

   a. prefer it b. generally like it c. it doesn't matter d. generally dislike it

   e. fear f. frustration g. other: _____

3. Whether at school, home, a friend or relative's house, which of the following activities have you experienced on the computer? Circle all that apply.

   a. games b. word processor c. e-mail

   d. surf Internet e. power point f. made a web page

   g. others: _____

Appendix B

Observation Checklist of Student Behavior in the Computer Lab

Computer Literacy Skills	FREQUENTLY	SOMETIMES	NOT YET
1. Access word processor			
2. Uses spell check			
3. Uses printer			
4. Saves on disk			
5. Exits program correctly			
Positive Student Behaviors			
6. Cooperation with each other			
7. On task/students engaged			
8. Evidence of positive attitudes about using computer technology			
9. Peer-review of rough drafts			
10. Second draft attempted			

Appendix C

Document Analysis of Students Writing Samples

Mechanics:	YES	NO
1. MLA set up		
2. Five complete paragraphs		
3. Thesis sentence with preview at the end of introduction		
4. Less than three spelling, grammar, and/or mechanical errors		

	FREQUENTLY	SOMETIMES	NOT YET
5. Uses transitions			
6. Uses topic sentences			
7. Uses examples to support topic sentences			
8. Uses complete sentences			
Content:			
9. Shows depth, judgment, and higher order thinking			
10. Evidence of metacognition			

Appendix D

Writing Prompt

Name: _____ Date: _____

Directions:

I am working on my master's degree. I am collecting information so I can write a thesis. I really need your help! Please read and respond to the following writing prompt. It is important that you do your absolute best. I WILL NOT GRADE WHAT YOU WRITE. Do not worry if you don't understand every part of the writing prompt. I simply ask you to do your best.

Writing prompt:

Carefully look over and reflect on your junior high English portfolio. Write a five paragraph essay evaluating the learning your junior high English portfolio is supposed to reflect. Try to write with depth and insight (i.e., use higher order thinking skills). Use everything you know about structuring essays and writing paragraphs. Be sure to use correct grammar, spelling, and writing mechanics. Follow the Modern Language Association (MLA) standards and set up. You may do whatever you need to do in order to write your very best five paragraph essay.

Appendix E

Post Interview with Low Achieving Students

1. Honestly describe your attitude about school in general.
2. How do you feel about using computer technology to complete assignments. Explain your answer.
3. Does using computer technology motivate you to learn? Explain your answer.
4. What do you prefer: using a computer to direct your own learning or having a teacher direct your learning?
5. Tell me about a time that you used computer technology to direct your own learning. What did you learn? How did you learn it? Why was this important to you?
6. What advice would you give to teachers about using computer technology to help students learn?